

## LIFE OF THE TISZA RESEARCH. CONFERENCE ON THE TISZA RESEARCH '71

Compiled by

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The Tisza Research Committee, according to its resolutions passed in the preceding years, organized a Conference in the club-house of the Szeged Committee of the Hungarian Academy of Sciences on May 8th 1971. In the framework of the usual annual reports, there were given in this year, too, some lectures treating of the main tasks of this research. Six lectures were followed by discussions, resp. by contributions to the debates. Later on, there were made some reports on the research work in other regions of the Tisza, as well, and a discussion of the detailed tasks of the labour plans and research aims in 1971 was put down in the agenda.

President of the Association, Prof. Dr. IMRE HORVÁTH emphasized in his opening speech the necessity of centralizing the research forces round two main tasks. He urged partly that the works in the region of water-basin "Tisza II" should be continued, and partly that the researches of complex character scheduled for the island at Körtvélyes in the nature conservation area of Mártély—Sasér should be performed at an accelerated pace.

An abstract of lectures, and of contributions to them, delivered in the framework of the Conference, is as follows:

### 1. L. GALLÉ:

Data to the myrmecological knowledge of the Tisza region at Tiszafüred.

As a result of the myrmecological investigations carried out in the future area of water-basin "Tisza II" in the years 1968—69—70, the occurrence of twenty-nine ant-species was proved. From among them, new species for the Tisza basin are: *Myrmica sulcinodis* NYL. (at Tiszaörvény) and *Lasius niger lasioides* EMERY (at Kisköre).

The myrmecological picture of the area is characteristic of the Middle Tisza, containing plenty of eremophilous elements and showing a mixture of ant populations that are characteristic of the Upper Tisza and strongly coloured by hylophilic-montanic elements.

The differences in the ecologic demands of the species may be measured on the basis of the numerical relations, too, as compared with the abiotic factors of the frequency of nests.

Flood is the most pessimal environmental factor of the Formicoidea fauna.

The various species partly differ from one another in the way of nutrition and the composition of food, as well, and can be classified on the basis of the biotic function-

ing of populations into the following groups: (1) First-class consumers consuming seeds (*Tetramorium* and *Messor*) and nectar (*Lasius*, *Plagiolepis* and *Formica*); (2) second- and third-class consumers consuming insects and spiders (mainly *Myrmica* and *Formica*, in smaller part *Lasius* and other species); (3) recuperaters are the *Lasius* and *Formica* species, consuming the discharge of tree-lice (aphids).

Contributions to the discussion:

Gy. BODROGKÖZY: He is asking if the lecturer carried out the recited investigations in the water-covered or flood-free region of dams.

I. HORVÁTH: He is asking if any investigations took place concerning the effect of the great flood of 1970.

The lecturer's answer is: He carried out the investigations on both ramps of dams, at both levels each. He performed investigations in connection with the great flood, as well, establishing that it had a great influence mainly on the woods of the flood area. The water-covered ramp regions were repopulated from above, by means of remigration.

2. D. GÁL:

Rhizopoda fauna of the Tisza region at Kisköre. (The paper containing the lecture is published in the volume of 1972 of the Tiscia).

Contributions to the discussion:

M. MARIÁN: He is asking if the soot mass fallen into the water at Tiszapalkonya could be weighed because it could get an important role in respect of the food-chain.

A. HORVÁTH: In his opinion, after damming up the Tisza region at Kisköre, a shift of the water towards a lake-like feature may be expected.

M. ANDÓ: According to him, the water-basin won't have lake-like feature for the function of the hydro-electric generators will assure a standing movement and the siltation will be slower.

The lecturer's answer: At Tiszapalkonya not soot but some greyish dust falls into the water. In his opinion, the siltation will be periodical, and the fauna won't be washed out of the backwaters.

3. A. SZITÓ:

Data to the Orphan gnat fauna of the future water-basin area at Kisköre. (The material of lecture takes place in the author's paper published in the volume of 1972 of the Tiscia).

Contributions to the discussion:

M. MARIÁN: He thinks good the elaboration of the material from Kisköre with the method reported. He emphasizes also the important practical relations of the lecturer.

A. HORVÁTH: He emphasizes the role of the robust gnat grubs in feeding the fish.

4. P. MARÓY:

Data to the beetle mite (Oribatidae-family) fauna in the backwater of the Tisza region at Tiszafüred.

The beetle mite fauna of the Tisza-basin has so far been completely unknown. My collections performed in the area of Tiszafüred in the years 1969, 1970, gave information on the beetle mite fauna in the soil of natural vegetation being dominant in that area.

In the area of Poroszló, in the beetle mite fauna of the soil of a young willow-grove (*Salicetum albae-fragilis*) extending over a large territory, the mesoeury and mesohygic species (*Rhyotritia ardua*, *Ceratoppia bipilis*, *Scheloribates laevigatus*) are dominating. The terricolous and leaf-litter dwelling life forms are dominant.

In the same area, in the fauna of the old willowgroves are dominant similarly

the meso-, eury- and mesohygric species but also the poly-, mesopoly and mesopoly-euryhygic species enjoy a greater role. The life form of dwelling in the leaf-litter is the most important.

In the willow-plantation overgrown with *Vitis silvestris* mainly meso- and meso-euryhygic species (*Scheloribates laevigatus*, *Oppia splendens*, *Oppia nitens*, *Ceratomyxa bipilis*, *Damaeus verticillipes*) have been found. The occurrence of *Camisia biurus* is a surprise. The large number of the small-bodied Oppiae climbing up the plants is striking.

In the soil of the acacia grove grown outside the dam in the area of Tiszaszöllös the meso-, mesosteno-, and mesopolyhygic species are dominant (*Oppia obsoleta*, *Galumna lanceata*, *Gustavia microcephala*). The alkalization is shown by the presence of Polyion species. The occurrence of *Gymnodamaeus bicostatus* is a surprise; that species could not be demonstrated, so far, beside the Tisza.

In the dam section at Tiszaszöllös, the dominance value of the highly tolerant (eury-, euryhygic) species is above 50 per cent (*Scheloribates laevigatus*, *Tectocephus velatus*). Both species are very frequent in the alkali grass. The coexistence of the mesosteno- and polystenohygic species must have been caused by flood and high soil-water. *Protoribates capucinus* occurs in similar plant associations of the dams in the environment of Szeged (*Alopecuretum pratensis festucetosum pseudovinae*) with a much higher dominance value.

#### Contributions to the discussion:

GY. BODROGKÖZY: The lecture delivered cleared the way to the biological research in stricter sense of the Tisza-basin. He regards desirable to get on with developing the cooperation more broadly.

A. HORVÁTH: In Hungary a great number of mite species are living but the number of research workers dealing with mites is, unfortunately very low in this country. His question regards the part played by stand and microclimate in the formation of the fauna demonstrated.

Lecturer's answer: It is difficult to separate the part of vegetation and microclimate.

#### 5. M. ANDÓ:

The major natural-geographic components of the flood situation in the water-system of the Tisza. (The material of the lecture was published by the author and co-worker in the volume of 1973 of the Tiscia).

#### Contributions to the discussion:

I. HORVÁTH: The lecturer analysed in extenso the flood problems of the Tisza-basin in 1970. He considers desirable to bring it out in full in our publication.

I. VÁGÁS: He is emphasizing the importance of complexity, of amplifying the Tisza-research more and more with geography and microclimatology. In the name of the Water Office he is offering thanks to the Tisza researchers who participated in flood-prevention. In 1970, the river Maros was torrential at the Tisza culmination usual in the months May and June. There occurred even an increase of 11 to 12 cm/hrs.

K. BÁBA: The inundations in Italy are generally explained by the lack of woods. Woods should, namely, store water. What is the situation in our territory?

T. L. BOGA: Where in this period there was abundance in precipitation, the region has been poor in woods since the beginning of this century. The subsoil has at the same time been clayey, its water-capacity being, therefore, smaller. In many places, the felled timber is left on the site for compensating the soil erosion.

M. MARIÁN: He is giving utterance to his joy for having heard in such a detailed way about the causes of the great flood in 1970.

Lecturer's answer: He thanks for the valuable completions. He wants to publish the material of his lecture in a paper written together with Dr. VÁGÁS. The deforestations in Rumania may have contributed to the development of flood situation.

#### 6. G. UHERKOVICH:

Division in time and space of the rheon-, rheoplankton-, and plankton-character of the bioeston in the Tisza, with particular regard to the dammed reaches.

Instead of the older notion of "potamoplankton", delimited rather uncertainly and being not irreproachable in terminological respect, either, — first of all on the basis of the quantitative investigations of the longitudinal section carried out on the bioeston of the rivers — we use nowadays more a notional and terminological delimitation by speaking in case of the rivers of the bioeston of rheon-, rheoplankton-, and plankton-character. We speak of rheoplankton if the organisms torn down from the bottom of river bed, or stirred up there, are dominant in the community. In case of plankton-character, however, the real plankton-organisms become dominant because in that bed-region the conditions of a real planktonic way of life are given. In the transitory community between the two types, the rheoplankton, both the rheon- and the plankton-characters are to be found, without either of them becoming dominant.

On the basis of the analysis of the bioeston and the topographical conditions we can draw the map that indicates the average character of the bio- (more closely phyto-) seston in the water-system of the Tisza in the single river-regions. In that a particular part is taken by the regions dammed back where in a considerable part of the year some rearrangement may be observed in the communities from the fresh-water character towards the lacustrine basic character. On the other hand, there can be noticed a rearrangement like this hardly or not at all in the river barrages in the periods of high water output when there is an intensive streaming through the barrages.

It is also proved by the quantitative investigations of the longitudinal sections that the rheon-character of the bioeston may shift in space and time towards the lower bed regions in time of large water outputs as well as that, in case of some accessory waters, the rheon-, resp. rheoplankton-character is permanent as far as till the mouth of the river.

The more or less pregnant rheon-, resp. plankton-character of the bioeston determines then the formation of the degree being eutrophic, able to carry out self-purification, etc., and here the data revealed by the basic researches are already serving the management of water-supplies.

#### 7. L. GALLÉ:

The lichen vegetation of ashen trunks in the inundation area.  
(The lecture delivered is taking place in the volume of 1973 of the Tiscia).

Contributions to the discussion:

G.Y. BODROGKÖZY: He is pleased to greet the lecture making known new data about lichen cenology. He suggests the lecturer to carry out exact measurements concerning the strength of illumination, as well, in the future. He regards interesting the connections in relation to the pH values.

M. ANDÓ: He is suggesting to carry out measurements at the synecological investigation of lichen cenoses, too.

M. MARIÁN: He would regard desirable to amplify the investigations in the direction of production-biology. For that purpose, the woods in the inundation area at Kisköre promise to be a highly suitable and important investigation area.

E. DONÁSZI: He is inquiring about the influence of the macroclimate upon the single lichen cenoses.

Lecturer's answer: He had carried out light-intensity and evaporation measurements in former times, as well. He has not investigated the effect of vicinity of the Tisza on the lichen cenoses, as

yet. But he performed production measurements previously on terricolous lichens. From this point of view, the collection of the corticolous lichens is a rather difficult task. He regards: doubtless the effect of macroclimate. In connection with that theme he is going on to publish a separate paper.

#### 8. GY. BODROGKÖZY and I. HORVÁTH:

##### Vegetation of the dams along the Upper Tisza.

In our lecture we want to report on the dam vegetation of a composition different from other Tisza-regions and their synecological conditions as developed in the area of Vásárosnamény and Csap.

(1) It could be established that the influence of the particular soil conditions in the Nyírség and the Tisza-basin prevails first in the development of the secondary grass cover. The building material of the dams running here, the sandy, silicic, brown forest soil found in the lower layers is a mixture of the alluvial poured soil of the river. A chemical reaction poor in calcium carbonate predominates. That is connected with the effect of the climate of montan character, together with the given local exposition differences.

(2) The dam grass developed here is essentially differing from the vegetation cover of the upper and lower Tisza-region in Hungary. There are generally predominating the subassociations, differentiated by the exposition of the secondary *Medicago-Festucetum rupicolae*, rendering a fur-grass character. Its characteristic species are: *Medicago varia*, *Festuca rupicola* as well as, appearing as a result of the river water, *Clematis integrifolia*, *Galium rubioides*, *Galega officinalis*, *Lathyrus pratensis*.

The subassociation *Arrhenatherum elacius*, characterized in case of northern exposition by a lower species number, appears, together with wood species escaped here, like *Veronica chamaedrys*, *Geum urbanum*.

In case of southern exposition, the subassociation *Poa angustifolia* characterized by a higher species number, appears together with *Festuca rupicola*, *Medicago varia* and several other xerothermic species of high dominance.

*Rumex acetosella* *R. acetosa* and *Medicago varia*, mentioned above, as well, are characteristic of these acidic soils.

#### 9. MAGDOLNA FERENCZ:

Zoobenthos investigations in the Tisza and the Maros. (The material of lecture is published in a paper of the lecturer and a co-worker in the volume of 1972 of the Tiscia).

##### Contributions to the discussion:

I. HORVÁTH: He would regard important at zoobenthos investigations to observe the effect of the speed of water-course.

A. SZITÓ: He is inquiring the Lecturer about the usability of the large-sized *Branchiura* as fish foods and if this species lives in still waters, too.

A. HORVÁTH: He considers the appearance of the species *Pisidium* in the Tisza to be valuable, emphasizing also the importance of the complex effect of the speed of water-course. He is referring to the difference of the Tisza and Maros concerning the richness in fauna.

M. ANDÓ: He regards similarly important to measure the speed of water-course.

Lecturer's answer: Also she thinks important to measure the drift speed of water but measuring has met so far technical difficulties. There are no data to be found in special literature in regard of the occurrence of *Branchiura* in still water.

10. J. GAUSZ:

Orthoptera associations along the Tisza.

The Tisza-basin shows many differences from the adjacent areas in microclimatic respect and as regards vegetation and soil science, and that is valid for the Orthoptera fauna, as well. These characteristics are the following:

(1) The Hungarian region of the Tisza is homogeneous in respect of the Orthoptera populations, although assuring some possibility of penetration for the montan species in the northern territories.

(2) In the development of associations the part of local factors (exposition, height of vegetation, shadiness, disturbing) is more important than the climatic factors.

(3) The typical associations of inundation areas are rather rare, and we can reckon with them only in spaces where there are meadows of considerable extent inside the inundation area.

(4) In the associations, the species of the mesophilic-hygrophilic transitional meadows, that are common elsewhere, too, are the most important ones.

(5) Floods have a deleterious effect only if they pass over to the late Spring or Summer period, as well. Are they in an earlier period then it is not necessary to plant a new every year.

(6) The migration of Mediterranean species in northern direction is definitely promoted by the river dams, resp. by the inundation area.

Contribution to the discussion:

M. MARIÁN: According to his observation, the conditions of the distribution of *Lacerta taurica* have changed similarly to those of Orthoptera.

11. K. BÁBA:

Peopling of the inundation area of the Tisza by Mollusca. Regeneration of the snail populations in the area of river barrage „Tisza II”.

The Lecturer investigated in the years 1969—1970 the conduct of snails in the inundation area (*Succinea oblonga* DRAP., *S. Pfeifferi* ROSSM., *Zonitoides nitidus* O. F. MÜLL., *Monachoides rubiginosa* A. SCHMIDT) in connection with the water-cover (in 210 reference points in the area of Tiszaszőlős, Óhalászi, Tiszaörvény, Poroszló). The species enumerated can endure — according to earlier investigations of the author — water-cover for a short time.

It is shown by the results of cenological investigations that the structure of populations becomes simpler in the period of a longer water-cover. There survive three of the five to nine species: *Succinea Pfeifferi*, *Succinea oblonga*, *Monachoides rubiginosa*. At the surviving species, the constancy of the first two ones is reduced the least. The dominance of *S. oblonga* increases somewhat. These species can be found only in higher inundation areas that are less disturbed by silt deposits. In the inundation areas of the Middle Tisza region, *Zonitoides nitidus*, that is besides some specimens of the species enumerated of the greatest characteristic, tides over the hardships of flood, together with several other species of animals, among the adventitious root-knots developed on the willows. *Z. nitidus* even oviposits on the trees.

The snail populations do not perish on occasion of prolonged floods. They survive on the soil (*S. oblonga*, *M. rubiginosa*) and in the suitable shelters of trees and regenerate the original conditions of distribution of the population.

#### Contribution to the discussion:

A. HORVÁTH: It is an interesting question, what happens with land snails in case of flood waves and how they regenerate. In this field, the trees of the inundation area have important role. The situation is different in case of earthworms that penetrate so deep into the soil that they escape the perishing effect of flood.

Lecturer's answer: Land snails are carried by water, as well. But the populations developed in the inundation area do not originate from species carried by the water. These species endure inundation for long time. The ovules of *Helix*, for instance, are hatched in a higher percentage after being covered by water for five days. (Communication of DR. RICHNOVSZKY).

#### 12. R. VÁMOS:

The role of calcium in the lack of fish-perdition caused by  $H_2S$ .

In backwaters of the rivers Tisza and Kőrös there occurs sometimes fish-perdition en masse, engendered by  $H_2S$ .  $H_2S$  is formed in the anaerobic silt by sulphate reduction and multiplies in form of ferrous sulphide. When, after a longer warm weather, the air gets cooler the conditions in the surface part of silt become aerobic again, ferrous sulphide oxidizes getting sulphuric acid. Sulphuric acid releases in its vicinity quickly a great mass of hydrogen sulphide, that rises into the water layer exerting there a poisoning effect, and the perish of fish begins.

These fish destructions cause damage only in the dead channels of the Tisza and Kőrös where the silt does not contain any calcium. In silt of the dead channels of the Danube, however, a considerable quantity of calcium is present in fine distribution; neutralizing the sulphuric acid developed. In this way, calcium prevents hydrogen sulphide from being released in quick time and in a concentration being already lethal for fish. In dead channels of the Danube there occurred therefore never any major fish destruction.

It is therefore advisable to disperse calcium in the upper region of dead channels where the destruction of fish generally begins.

#### Contributions to the discussion:

P. BERETZK: The water of the lake „Fehértó” is chalky, nevertheless the fish perish. Why?

A. SZITÓ: What can be expected in the water-basin at Kisköre?

Lecturer's answer: The water of the Fehértó is alkaline. In the time of the destruction of fish there is no  $H_2S$  in it. The destruction may only be caused by ammonia, released mainly in the period of early Summer. The formation of  $H_2S$  takes place, on the other hand, at the end of Summer as a result of FeS oxidation. Then also sulphuric acid is formed that is fifty times more poisonous than  $H_2S$ . The soil of the water-basin at Kisköre is solonetz in more places, containing much organic matter. Consequently, a high-degree gasification is to be expected.

#### 13. M. MARIÁN:

Vertical location of the oecuses of Amphibia in the inundation area of the Lower Tisza and the regeneration of the fauna.

In the course of my investigations carried out for then years I have ascertained that the occurrence of the amphibian species along the Lower Tisza, in the inundation area, are showing the following vertical layers:

(1) Bottom level. The deepest level of the inundation area. The 40 to 50 cm deep bottom of barrow pits, draining ditches, covered with dense hair-weed, debris. *Triturus cristatus* and *Triturus vulgaris* live here.

(2) Water level. It is the border water of barrow pits, draining ditches where *Bombina bombina* lives among a floating vegetation. At the same place, and even more at the grass-grown, weedy ledge of pits and ditches lives *Rana ridibunda*.

(3) Ground level. The wet, marshy soil of the woods in the inundation area, with low vegetation. *Rana arvalis* Wolterstorffi lives there.

(4) Level of alluvial hills. Parts of ridges, resp. hills formed by inundation alluvium between the barrow pits, covered with grass and dispersed bushes. Abode of *Rana dalmatina*, *Bufo bufo* and *Bufo viridis*.

(5) Level of high vegetation. The crown level of bushes and trees of woods in the inundation area already rises much above the ground level. Here lives *Hyla arborea*.

It may be established, therefore, that the abodes of the amphibian species living in the biotop of the inundation area can be found from the water bottom until the upper zone of the foliage of trees, showing about six to eight metres high extent in perpendicular direction.

The inundations of the Tisza, repeated yearly habitually, particularly the cold flood in Spring, are often very high, filling in completely the inundation area between the dams. The flood of strong drift kills the Amphibia living at levels 1, 2, 3, and 4 or it carries them simply out of the inundation area. As a rule, only a great part of the *Rana ridibunda* population and a fragment of the *Bombina bombina* population can get till the dam and through it into the protected area. A great part of the *Hyla arborea* population, living at level five, can tide over the hard times of floods, as well.

The amphibian fauna of the inundation area is repopulated again from the area protected. The starting-points of regeneration are the bank regions where the dead channels outside the dams approach the inundation area (Dead-Tisza at Már-tély, mouth of the Kurca).

Contribution to the discussion:

K. BÁBA: The *Rana* species overwinter in silt. Is this important for regeneration?

Lecturer's answer: *Rana esculenta* overwinters in silt, the other species rather in the leaf-litter.

The real water frogs can survive in silt, too, during the uncongenial season, the other species, however, probably cannot.

14. GY. CSIZMAZIA:

Mammalogic observations carried out during the Tisza-inundation in 1970.

During the great inundation of the Tisza in 1970 I had the opportunity to perform mammalogic observations on the dams of both banks of the river from Csongrád till the Yugoslav border. In the present paper I have collected data, that are useful for the anti-inundation work, about size and form of the ducts, canals, and nests prepared in the body of dam by Mammalia living in the dam.

I have collected data about the hunting and living ducts of together six mammalian species. These are: the gleaner mouse, field-vole, mole, souslik, wharf-rat, and ondatra. The hunting and living ducts, after being revealed, were photographed and drawn. The activity of the above-mentioned six mammalian species in the dam engendered the following problems in connection with security in water protection.

(1) In the sections pierced by ducts, living cavities, the bio-corroding layers were to be left out of consideration at taking into account the measurement of the water-induced land-slide and overturning of dam-body (Tápé—Vesszős: souslik, mole, and field-vole).

(2) Because of the living ducts, the danger of the oozing level-line being cut out of the dam-body increases more and more, taking into consideration that, in case of such a high inundation, the produced oozing water level may cross the sur-



face of the dam crowning on the side protected. In the mammalian ducts the draining off of water can be almost unhindered as compared with the process of oozing. (Körtvélyes, Atka: mole, ondatra, gleaner mouse, and wharf-rat).

(3) The mammalian ducts penetrating into the dam may make dangerous the otherwise harmless inhomogeneities that become, owing to the mammalian canals, of increased importance (e. g. at the Máros: souslik-colony at the great bursting at Makó).

(4) Finally, it cannot be neglected, either, that owing to the ducts near the surface the dam-protecting plant cover is destroyed in spots and, therefore, the resistance of the ramp to waves and erosion decreases in a high degree. (Csongrád, Sasér, Boszorkánysziget: gleaner mouse, field-vole). It is not solved, as yet, how to eliminate the activity of Mammalia living in the dam, which activity is harmful to the protection against floods. It seems, therefore, to be important to continue performing the observations in this direction for giving aid to our organs of flood-control.

#### Contributions to the discussion:

M. ANDÓ: He adds to the facts mentioned above that the mammalian ducts dug into the dams may increase in high degree the danger of dam-slide.

P. BERETZK: As he is informed, the extermination of sousliks takes systematically place. The question is whether the others are destroyed, as well.

M. MARIÁN: There would be needed more experimental observations. He suggests to put on the dam-ramps T-shaped wooden perches for making easier the settlement of raptorial birds.

I. HORVÁTH: He is pleased to see that the Tisza research has resulted not only in theoretical accomplishments but it has led to important results in practical relation, as well.

G. SZEMES: He wants evaluate, as an invited guest, the lectures delivered. They are proving a very serious work. He is glad to observe that several investigators functioning in other regions of the country have joined forces with the researchers in Szeged. In this way the work can be continued in the spirit of social co-operation. He approves of the researches carried on in a more and more complex direction. It is important, to investigate the natural history of the Tisza always as depending on the water-level. Last but not least, he is speaking with recognition about the participation and directive activity of the steering committee and first of all of Prof. Dr. IMRE HORVÁTH.

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The next question was a conference on the work programme added to the agenda by the President of the Tisza Research Association. In the course of that made known the decision of the Management in connection with the reports about the research work of the members of the Association. He announces that in the region of Hódmezővásárhely the inundation area of the Tisza at Mártély—Sasér has been declared a nature conservation area by the Office of Preservation of Nature. He holds desirable that, apart from the complex research work going on in the area of the future water-basin at Kisköre, the investigators should begin the research tasks of the island at Körtvélyes in the new nature conservation district, as well. It is to strive, here too, for the increased complexity of investigations, taking into consideration the exact characterization of the abiotic and biotic environment. He emphasizes the necessity of applying and using in higher degree the up to date, exact statistical methods. As in this field the objective conditions are not satisfying, as yet, an increased aid by the biological Chair of University would be desirable.

He makes known both main directions of research in the fifteen-year long-range plan: the protection of biosphere and the bioregulation. The Tisza research will be interested immediately first of all in the first group of themes.

#### Contributions to the discussion:

- P. BERETZK: He inquires after which areas along the Tisza, and in addition to the island at Körtvélyes, could practicably be declared a nature conservation area.
- I. NEMES: He is recommending to declare the willow-poplar wood and meadow at Tápé a nature conservation area.
- Gy. BODROCKÖZY: He is requesting M. ANDÓ to mark the exact places of the microclimate measurements in the maps of work of both areas investigated.
- S. TÓTH: He emphasizes the importance of complex researches. He would be pleased to see the members of the Tisza-research Association connected, if possible, with the programme of Bakony-research. The material possibilities, as well as those of publication, are assured.
- I. KOLLÁR: He is missing an increased support of the investigation of fish in the Tisza. In his opinion, there was reported but very little about this question in the course of this Conference.
- M. MARIÁN: He thinks important to co-ordinate the dates of investigations, resp. collections to be carried out in the area at Kisköre. He proposes to organize them from May 15 until June 15.
- A. SZITÓ: He thinks to be more successful to co-ordinate the dates of the mentioned research works and collections according to the groups of research projects.

#### Chairman's evaluation:

- I. HORVÁTH: In the course of summing up and evaluating the results of the Conference, he establishes its having been necessary and useful. He suggests that the Tisza Research Committee should call a Conference of similar character in the same period of next year. In the framework of that, the lectures to be registrated beforehand ought to be delivered in the following order of importance:
- (1) Lectures connected with Kisköre, (2) Reports on the results of researches carried out at Körtvélyes. (3) Lectures about other Tisza regions.

#### Notifications:

- E. DONÁSZI: He appreciates the help given to the Tisza research work for carrying out the programme of the Ministry for Agriculture and Food Supply, evaluating from this point of view the lectures delivered. He proposes to use at the investigations of production the methods and terminology accepted internationally.
- I. HORVÁTH: He makes known that, for putting into practice the proposal presented during the Conference, the international publication series for methodology have been subscribed for and the researchers will get the mimeographed copies of that.
- M. MARIÁN: He is informing those present about the present material situation of the Association. He announces that the Hungarian Academy of Sciences has not opened, as yet, the side of expenses for major subventions. That can be expected for the end of July. The research ship is only available so far for lesser collecting trips.
- Gy. BODROCKÖZY: He is reporting briefly on the printing problems of the publication Tiscia. The date of presenting the manuscripts of papers to be published is the end of July of every year. The lectures delivered at the Conference, possibly in form of increased monographs, are to be submitted to the drafting committee in the same time-limit.
- I. HORVÁTH: He thanks the members of the Association for their active participation, for the lectures, contributions and the replies given to them. Expecting their further devoted activity, he declares the Conference closed.

#### Changes in the Tisza Research Committee

The governing body of the Association, in the committee meeting of this year, are commemorating the grievous loss that fell on the scientific life owing to the death of DR. A. HORVÁTH, member of the Committee, co-redactor of the Tiscia. President Prof. DR. I. HORVÁTH expresses appreciation of the imperishable merits of the late investigator inside and outside the Association.

DR. G. UHERKOVICH and DR. J. MEGYERI, referring to the change in the sphere of their activity, resp. to other engagements, resign their membership in the governing body and in the Association. Leading professor of the Zoological Chair, Prof. DR. L. MÓCZÁR is elected zoological vice-president.

The present composition of the Committee is as follows: